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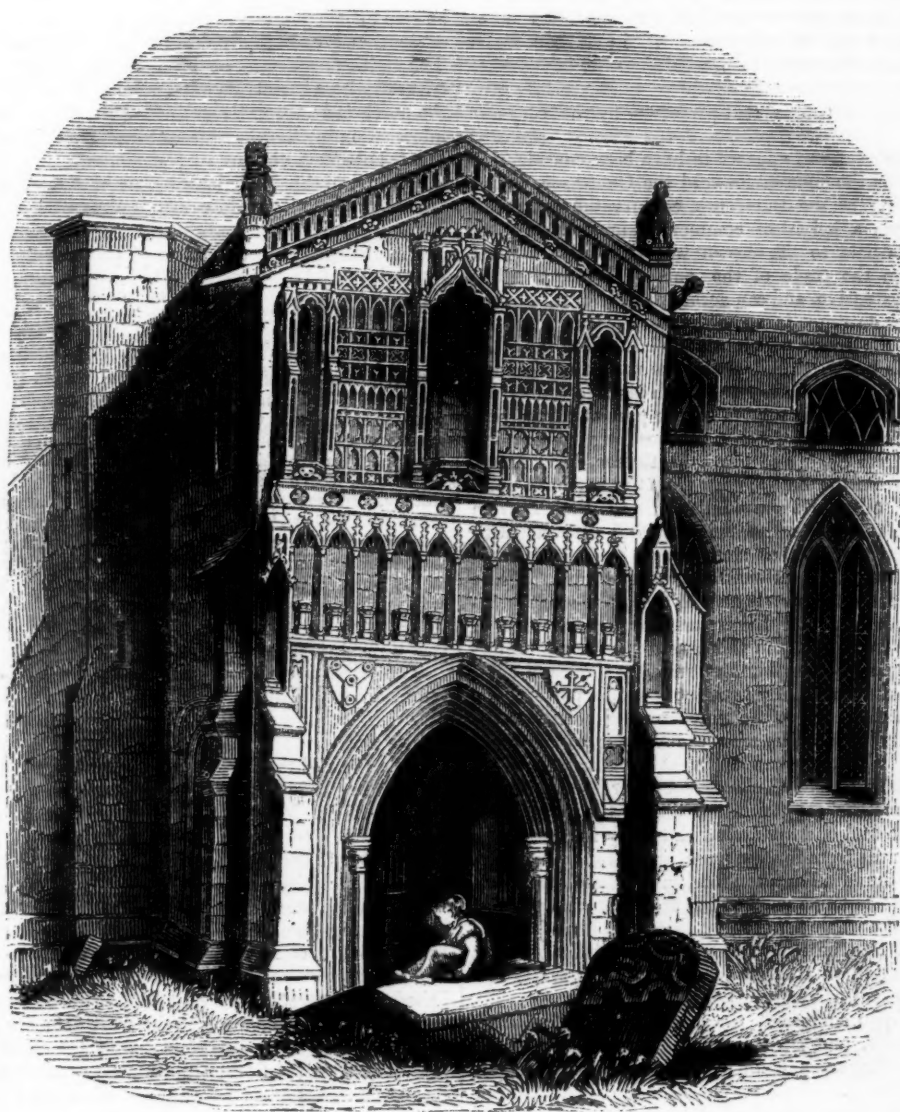
JANUARY



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ONE PENNY.

THE TOWN OF LYNN, NORFOLK.



SAINT NICHOLAS CHAPEL, LYNN.

In the flourishing town of Lynn, Norfolk, stands the Chapel of St. Nicholas, (said to be the largest parochial chapel in the kingdom,) of the architectural embellishments of which we give our readers a specimen in the above view of the southern porch.

Lynn is situated chiefly on the eastern bank of the river Ouse, about twelve miles from the sea, where that river, having gradually widened its channel, becomes very considerable, and nearly equal to the Thames above London Bridge. This important stream is sometimes called the *Great Ouse*, to distinguish it from the *Lesser Ouse*, which is one of its tributaries. It is also called

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the *Eastern Ouse*, to distinguish it from the *Northern* or Yorkshire river of that name. To this river the town of Lynn owes its chief importance, for by it commercial intercourse is carried on with the interior of the country to a great extent, and a communication with the sea is formed. It would be interesting to trace the course of this river from the place of its rise on the borders of Northamptonshire and Oxfordshire, through the midland counties, of which it traverses a considerable part, to its junction with the sea. Many ancient halls and noble edifices grace its banks and those of its tributary streams, and the fenny and marshy districts

through which it flows have also their own peculiar interest. But we are now to speak of the town of Lynn itself, and of the edifice we have selected for description.

Lynn is situated on the eastern side of Marshland, and of the Great Level or Fen Country, and has been called the great metropolis of the Fens. It was anciently called Bishop's Lynn, having been under the jurisdiction, both temporal and spiritual, of the Bishops of Norwich, who had a palace where Gaywood Hall now stands. The episcopal authority was surrendered in the reign of Henry the Eighth, and from that time the town was called King's Lynn. During the contest between John and the barons, Lynn was remarkable for its constant adherence to the king, who remained there for some time, and at the prayer of the bishop made the town a free borough; he presented to the inhabitants a silver cup, weighing seventy-three ounces, richly gilt, and enamelled, which is still preserved by the corporation.

The trade of Lynn appears to have been considerable as far back as the time of Edward the Confessor, and at the beginning of the thirteenth century the town had risen to such a height of commercial importance, that the revenue paid to the crown was two-thirds of that arising from the trade of the port of London. The harbour is extensive, and can accommodate three hundred sail, but the entrance is somewhat dangerous from the shifting of the sands which accumulate there, and the anchorage is rendered difficult by the nature of the soil and by the rapidity of the tide, which rises to the height of twenty feet. The situation of the port of Lynn renders it a place of much foreign and coasting trade: it imports wine from Spain and Portugal; timber, deals, hemp, and tallow from the Baltic; corn from the northern parts of Europe; oil-cake from Holland; and timber from America. It supplies the neighbouring districts with these imported articles, as well as with agricultural produce, by means of its extensive coasting trade. White sand of a particular sort is sent to the glass manufactories of Newcastle and Leith; and large quantities of shrimps are conveyed from this coast to the London markets. Not less than one hundred and fifty thousand chaldrons of coal are annually brought into this port, for the distribution of which in the neighbouring counties, the Ouse and its tributaries, with the various canals communicating with them, afford great advantages. That the reader may judge of the extent of traffic connected with this port, we may mention, that in the year 1826, sixty British and one hundred and twenty foreign ships entered inwards from foreign parts, and, twenty-one British, and one hundred and ten foreign vessels cleared outwards. Several ships used to be fitted out annually for the Greenland whale fishery, but this branch of the business has of late years greatly declined. Ship-building has been carried on at Lynn from an early period, but is not at present of very considerable note.

King's Lynn comprises the parishes of All Saints, St. Margaret's, and St. Edmund. Of the churches of Lynn, St. Margaret's being undoubtedly the most important edifice, first demands our attention. This church was founded about the close of the eleventh, or commencement of the twelfth century, by Herbert de Losinga, bishop of Norwich. According to an old record, he commenced building it at the request of the men of the town of Lynn, but the contributions proving inadequate to the magnitude of the work, he had recourse to the unworthy expedient of offering indulgences, or pardon of crimes for forty days, to all who would contribute to the undertaking. This plan proved eminently successful in raising money sufficient for the completion of the edifice; "the work," says the historian of Lynn, "went on prosperously, was soon finished in a magnificent style, and the indulgence effected what an appeal to the most pious considerations would probably have failed to accomplish."

The church, in its original state, was of larger dimensions, and more magnificent than at present; but it still presents a noble appearance. The western tower displays different styles of architecture, and the lower part of them is evidently very ancient. The interior consists of a nave with aisles, a chancel, or choir, with aisles, and a transept. A tall spire once adorned one of the western towers, but this spire fell in 1741, and did much damage to the body of the church. Soon after that event, the lofty tower, or lanthorn, which rose above the intersection of the cross aisles, was taken down through fear of a similar misfortune.

The chapel of ease to St. Margaret's is St. Nicholas, an elegant chapel, built upon the site of one much more ancient, and elaborately decorated in many of its parts. The south porch may be seen by our engraving to be covered with a variety of minute ornaments. The roof of the porch is handsomely groined with stone, and at the intersection of the ribs are some heads and figures in bold relief, but much obscured by whitening. The interior of the chapel of St. Nicholas consists of a lofty nave, with two side aisles: its architecture is thus described by the Rev. Edward Edwards.

The distinguishing characters of this structure, as seen from within, are lightness, simplicity, and perfect uniformity of style, the tower alone being of earlier date than the rest of the fabric. The pillars are slender, having the horizontal section of the shaft nearly in the form of a truncated lozenge, relieved by shallow flutings, and raised about four feet from the ground by corresponding bases. They have no capitals, but small brackets, which support the inner ribs of the arches. Opposite the arches, in the side aisles, are an equal number of windows: between the windows are niches or canopies. The east and west windows are very large, with a pleasing mixture of curved and rectilinear tracery, and embattled ornaments upon the transoms. More ornament has been bestowed on the doors than on any other part of the building. The western door-way, in particular, is divided by a mullion, which supports an elegant niche, and is adorned with other sculpture in stone. The small south door-way is in the same style, as is also the larger door-way towards the north. The front of the *South Porch* is still more elaborate.

The original chapel is said by Parkin to have been founded by William Turbus, or De Turbe, bishop of Norwich, who was consecrated in 1146, and died in 1174. He gave it to the monks of the Priory of Norwich, but forbade the rights of baptism and marriage to be performed in it, in order to mark its dependency on the church of St. Margaret's. Attempts were made, at various times, to raise it to the dignity of a parochial church, but it has ever remained annexed to St. Margaret's as a chapel of ease.

The edifice appears to have been rebuilt in its present state during the reign of Edward the Third, and until lately a figure closely resembling the usual portraits of that monarch, with three crowns on his sceptre, embellished the centre of the west window. The ornaments above the canopied niches at the west door are also said to appear very much like the crest of the same king, as represented on his first gold coin, the quarter florin.

The churches of All Saints and of West Lynn have nothing remarkable in them to require description, and the church of North Lynn, or Lynn St. Edmund's, was swept away by an irruption of the tide, or by the inundation of fresh waters, caused by the addition of the Grant, the Ouse, and the Nene, to the other rivers which had their passage to the sea near this town.

At a small distance from the town of Lynn stands a very singular little building, called the Chapel of Our Lady on the Mount. "If other buildings attract notice by their magnitude," says the author before quoted, "this deserves it from its peculiar smallness. It is so well proportioned, yet so extremely diminutive, that it seems like a beautiful model for a much larger edifice, or it may not improperly be denominated a cathedral for Lilliputians." The history of this chapel is involved in

much obscurity. There are records extant of offerings made by devotees at the chapel of the Virgin Mary at the Mount, but the uses to which the building has been applied at various periods, subsequent to the date of these records, have been of a very opposite character. In 1638 we find it to have been used as a store-house for gunpowder: in 1643 it became a place of arms, and had a regular bastion thrown up in front of it, and it is supposed that a cistern, visible until a few years since, in the lower apartment, was used as a reservoir for water. In 1665 it was used as a pest-house, and in 1783 the use of the chapel was granted to a teacher of navigation for an observatory.

There are still existing the remains of several other ecclesiastical edifices at Lynn. A tower, ninety feet high, remains of the monastery of the Grey or Franciscan Friars, and serves as a landmark to vessels entering the harbour. Several other signs of former monastic institutions are also to be met with in the town. Lynn has four almshouses, and many charitable institutions, an endowed grammar-school, national and Lancasterian schools, a mechanics' institution, a parochial and a subscription library. The population of the borough was, in 1831, 13,370.

THE name of a country may be obliterated from a map, the deeds of heroes be effaced from the annals of the world; the pursuit of truth can only cease when man is no more: its light may be veiled by ignorance, craft, or cupidity, but it cannot be extinguished. The cities that gave birth to the illustrious philosophers of old have long ceased to exist, yet the immortal works of those sages that have escaped the ravages of time, are still as fresh and luxuriant as when their glorious oratory enchanted and captivated their disciples' ears.—MILLINGEN'S *Curiosities of Medical Experience*.

GREAT mental capacity alone, will never raise either individuals or nations to greatness or happiness. It is not mere mental power, but the right application of it, that brings our species to perfection. We know how possible it is for men to possess powerful abilities and extensive knowledge, and yet live a curse to their own country and to themselves. But what then, it may be said, is become of the boasted alliance between knowledge and virtue? The alliance is indeed strong, but it is not because there is a necessary connexion between the bare knowledge of facts and moral emotions. It is because, moral sensibility being a part of our nature, we cannot dwell long upon any subject, nor investigate all its relations, without discerning in it some circumstances that touch on moral nature, and awaken a sentiment. No one is destitute of all moral feeling, but some people have very little by nature, or it may have been destroyed by the strength and indulgence of their passions; and in such cases the most thorough knowledge of the facts that move others to admiration and love, will have no effect upon them. It is not the philosopher's laborious analysis, nor the fulness of his demonstration of the times and motions of the heavenly bodies, that have a moral effect. It is the perception of order and contrivance of beauty, and of infinity teeming with existence, which kindles within him feelings of admiration inherent in his nature. In like manner, when we study the sciences that relate to human life, it is not the logical proof, that certain means will produce certain results, that causes our emotions, but that sympathy with the good of mankind is implanted within us; and pictures of their good, laid strongly before us, move that affection. The cold and the sordid will not feel it, however perfectly they learn the science.

The tendency of knowledge and study, therefore, certainly is to promote right feeling and conduct in general, by occupying the mind always about the true and the useful; but a tendency is not a certainty, for it may be overruled by opposing circumstances; and the mass of mankind are made selfish and stolid by their gross habits of life.

PHYSIC, for the most part, is nothing else but the substitute for exercise or temperance.—ADDISON.

GARDEN HERBS.

CHAMOMILE.

THE generic name of this herb is *Anthemis*, derived, as ancient story tells us, from a virgin shepherdess, named *Athemis*, who kept her flock near Cuma, and not far from the cave where one of the Sibyls delivered her oracles. *Athemis* was frequently required to assist in the mystic ceremonies, and on one of these occasions was so overcome with terror that she died on the spot, and was immediately transformed into a plant bearing flowers, which received her name.

This herb was also called *Leucanthemum*, or *Leucanthemus*, from the whiteness of the double blossom; *Eranthemum*, because it flourished in the spring; and *Chamamelon* (from which the English name is derived), because its savour was said to resemble that of an apple.

The genus of plants to which chamomile belongs is of the compound-flowered order. It is distinguished by having the scales that surround its flower-heads membranous at the border, like those of a chrysanthemum, from which genus it differs chiefly in the receptacle of the flowers being provided with little chaffy projections.

The wild chamomile is found more efficacious for the purposes to which the herb is applied than the cultivated sorts. It is frequent on many of the commons of England, and its finely cut leaves, scarcely elevating themselves above the level of the earth, and rich-looking flowers, of which the ray is white, but the disk deep yellow, have a pleasing effect amidst the scanty herbage of such situations. The whole plant is intensely bitter, especially the yellow flowers composing the disk. In the cultivated sort the white flowers of the ray almost supersede the yellow ones: the disk becomes extremely small, and thus the flowers possess the bitter principle in a less powerful degree. Besides the principle for which chamomile is chiefly celebrated, it has been found by chemists to contain tannin, camphor, and a volatile oil, of a beautiful blue colour. The description of this herb, given by Gerard, is exceedingly accurate, and gives a better idea of it than anything we could say.

The common chamomile hath many weak and feeble branches trailing upon the ground, taking hold of the top of the earth as it runneth, whereby it greatly increaseth. The leaves are very fine, and much jagged, and deeply cut, of a strong sweet smell; among which come forth the flowers like unto the field daisy, bordered about the edge with a pale of white leaves: the middle part is yellow, composed of such thrums close thrust together as is that of the daisy. The root is very small, and thready.

The may-weed (*Anthemis cotula*) greatly resembles chamomile, but is erect of growth, of a branching habit, and exceedingly disagreeable in its odour.

The most ancient recommendation of chamomile, as a medical herb, was made by Asclepiades, the Bithynian, who was renowned for his great skill in physic, and lived to a very advanced age, without ever having experienced a day's illness. Pliny tells us that he pledged himself to cease to act as a physician if he should be ever known to be sick. This celebrated man was entreated by Mithridates, king of Pontus, to reside at his court, and was even visited by ambassadors on the part of the king, with offers of reward if he would comply with the request; but Asclepiades had determined to exercise his skill in Rome; and there accordingly he went, and became the founder of a sect in physic, which was called after his name.

Recommended by such high authority, it is no wonder that the herb chamomile was highly esteemed among the Romans. An extract from the flowers and leaves was made into lozenges, for the relief of spasmodic disorders, as well as for the jaundice, and liver complaints; the powder of the dried flowers was administered in intermitting fevers; the leaves were given as a digestive, emollient, and diuretic medicine; and the whole plant was pounded, as a remedy against the sting

of serpents and other reptiles. The plant was also used in garlands, and even during winter a plentiful supply was to be had in its dried state for this purpose, as well as for use as a medicine.

Gerarde quotes from Galen concerning the virtues of chamomile, and adds his own testimony that it is of force to digest, slacken, and rarify; that it is a special help against wearisomeness, easeth and mitigateth pain, mollifieth and suppleth; is good against the colic, and various other diseases, and is mixed with good success with all those things that are applied to mitigate pain; "and all these operations," saith he, "are in our vulgar cammomile, as common experience teacheth, for it heateth moderately, and drieth little"

Culpeper says—

A decoction made of camomile, and drank, taketh away all pains and stitches in the side: the flowers of camomile, beaten, and made up into balls with gil, drive away all sorts of agues, if the part grieved be anointed with that oil, taken from the flowers, from the crown of the head to the sole of the foot, and afterwards laid to sweat in bed, and that he sweats well: this is Nechessor, an Egyptian's medicine. It is profitable for all sorts of agues that come either of phlegm, or melancholy, or from an inflammation of the bowels; and there is nothing more profitable for the sides and region of the liver and spleen than it. It comforteth the sinews that be overstrained, mollifieth all swellings: it moderately comforteth all parts that have need of warmth, and digesteth and dissolveth whatsoever hath need thereof by a wonderful speedy property. Syrup made of the juice of camomile, with the flowers, in white wine, is a remedy against the jaundice and dropsy: the juice of the flowers is good to wash the head, and comfort both it and the brain: the oil made of the flowers of camomile is much used against all hard swellings, pains or aches, shrinking of the sinews, cramps or pains in the joints, or any other part of the body. Nichessor saith, the Egyptians dedicated it to the sun, because it cured agues, and they were like enough to do it, for they are the arrantest apes in their religion I ever read of.

In more modern times Dr. James speaks of chamomile as a plant of many virtues, being stomachic, hepatic, nervine, emollient, and carminative, and as affording a useful fomentation in cases of inflammation and tumour.

In later medical books we find these uses of the herb slightly mentioned. The external use of it is said to be little preferable to a simple fomentation with hot or warm water, and the powder of chamomile is scarcely used, on account of the inconvenient bulk of a requisite dose. As a domestic remedy, the well-known stomachic virtues of a cup of cold chamomile tea, taken fasting, are alluded to, and the extract of chamomile is recognized as a good simple bitter, and a useful vehicle for other tonics, when given in pills. Forty-eight pounds of this extract are obtained from a hundred-weight of good flowers.

We have mentioned this herb as producing an oil of a beautiful sky-blue colour. This colour is not permanent, and is only seen in the recently-distilled product. The oil of chamomile, which we obtain at the shops, is generally foreign, and has become yellow, or brownish yellow, and grows viscid by age. Antispasmodic properties have been attributed to this oil, and hence it is occasionally added to cathartic pills and powders. In Germany this oil rubbed up with powdered sugar is a favourite stomachic remedy, but a very unpalatable one.

The cultivators of herbs in the vicinity of London produce the chief supply for the market. There are upwards of twenty varieties known to English gardeners, one-fourth of which are native plants. They differ considerably in their qualities, but those are the most esteemed which strongly exhale their peculiar fragrantcy when rubbed. The large double flowers are sometimes preferred, but, as we have already said, the bitter principle is most powerful in the disk, or yellow centre; and the single flowers are therefore the best.

Chamomile is a hardy perennial, and spreads rapidly. It is easily propagated by parting the roots in spring.

CALCULATING MACHINES.

2. THE APPARATUS OF SAUNDERSON, GERSTEN, AND PASCAL.

In our last article on this subject, we promised to describe an ingenious contrivance of Dr. Saunderson, for performing arithmetical processes in darkness. This remarkable individual, who was born in 1682, furnished an instructive example of the extent to which energy and perseverance may be made to overcome evils of a formidable and distressing nature. When only a year old, he lost his eyesight by an attack of small-pox; and being thus deprived of the blessing of light while yet an infant, his ignorance of its nature and properties was afterwards nearly as great as if he had been born blind. Yet such was the natural strength and intelligence of his mind, that he mastered all the usual branches of school learning, and became eventually Professor of Mathematics in the University of Cambridge, one of the most distinguished intellectual offices in England.

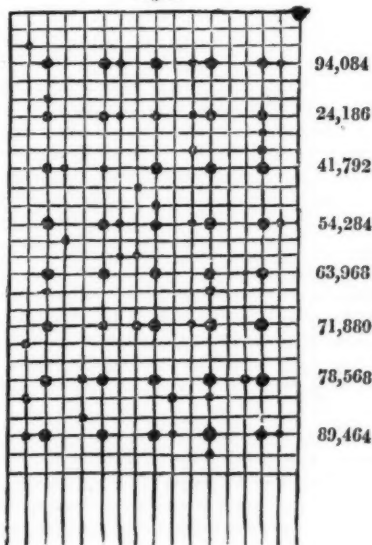
In the course of his mathematical duties, he had to perform many elaborate calculations; and still more was this necessary, before he could complete a treatise which, considering the circumstances under which it was produced, must be ranked among the most singular works published, viz., his *Treatise on Algebra*, in two large volumes. As the usual modes of writing with pen or pencil must obviously have been valueless to him, he had to devise a method by which he could feel the figures which he was arranging, or to establish a palpable arithmetic. We proceed to describe the plan which he adopted.

His calculating table was a smooth thin board, about a foot square, raised on a small frame, so as to lie hollow. The board was marked with a great number of parallel lines, which were crossed at right angles by another series of parallel lines, by which each square inch of the surface of the board was divided into 100 little squares, each square subdivided into four. At every point of intersection a perforation was made, capable of receiving a pin; and he always kept at hand two boxes filled with pins of two different sizes, or at least having heads of two different sizes; since it was by feeling the heads of the pins that he was enabled to perform calculations.

Fig. 1.



Fig. 2.



PROFESSOR SAUNDERSON'S CALCULATING MACHINE.

The particular position of a pin, or of two pins with regard to each other, indicated a particular figure; and for this purpose four little squares were appropriated to each figure, in the manner shown in fig. 1. A large pin

was placed in the centre, for every figure or digit, except 1, when its place was occupied by a small one. For the digits 0 and 1, no pins surrounded the central one; but for all the digits from 2 to 9 inclusive, a small pin was placed near the central one, and the position of this second pin determined the digit indicated by it; when over, under, or at the side, of the central pin, the even numbers 2, 4, 6, 8, were indicated; but when placed diagonally, the odd numbers 3, 5, 7, 9, were expressed. All this can be seen at a glance by inspecting fig. 1.

The symbol for each digit being thus established, it is easy to conceive that every quantity, large or small, might be expressed by an assemblage of such symbols. This tablet was large enough to contain a great many such symbols; for the space devoted to each was one-fifth of an inch square, a narrow vacant line separating it on every side from adjacent symbols. The great pins which usually occupied the centres, and which were most frequently equidistant, were a guide to direct him in keeping the line, to ascertain the limits of every figure, and to prevent any ambiguity that might otherwise arise. As three of the vertical parallels were sufficient for a single digit, so three of the horizontal ones sufficed for a line of figures; and the next three for another line, and so on. If one symbolical arrangement on the right signified the unit's digit, that immediately adjoining it on the left was the ten's digit, and so on; and when the figures or digits were thus expressed, it is obvious that any of the usual computations could be performed, in the same order as with pencil or pen, provided the sense of touch were sufficiently delicate to detect at once the relative positions of the pins, and whether the central one were large or small. In this respect the blind are often remarkably expert; for having one medium with the external world quite shut out, their attention is directed with greater intensity to those which remain. Saunderson could place and displace the pins with incredible quickness and facility; he could also break off in the middle of a calculation, and resume it when he pleased,—recalling to mind the condition of the computation by merely drawing his fingers gently over the table.

Fig. 2 represents a portion of a table which was left by Dr. Saunderson, and which he appears to have arranged for his own use. The surface of the tablet is seen to be divided into minute squares, of which one hundred are contained in a square inch; and if we separate these lines into parcels of three in width and three in height, each parcel will be devoted to one symbol or figure. We then have eight lines of figures, one under another, each line containing five figures, or expressing tens of thousands. So long as the arrangement of the pins was undisturbed, it is obvious that such a table would be a *permanent* one, which could be referred to at any time, and it appears to have been for such purposes that this method was peculiarly valuable to Saunderson. After Saunderson's death there were found four tablets, eleven inches long, five and a half broad, and half an inch thick, divided by lines in the manner before described, and perforated at the points of intersection of the lines. On these tablets pins were arranged, so as to form small tables, having apparently a connexion with the sines, tangents, and secants of angles. He also made use of his tablets for geometrical diagrams, by sticking pins in at certain points, and winding a piece of fine thread or silk from one pin to another: the pins indicated angles or corners, and the thread indicated right lines: a rough approximation to *curved* lines could also be produced, by placing the pins very close together.

Such is a slight outline of the means by which the professor sought to effect that which might be thought almost unattainable by a blind man. It will be readily seen that many other kinds of palpable or tangible arithmetic might be devised, bearing resemblance, more or less, to that of Saunderson. We shall there-

fore not enlarge on this subject, but shall proceed to speak of methods in which machinery is brought in aid of calculation. What we have hitherto described are merely *instruments*, but there have been other contrivances deserving the name of *machines*, by which calculation was sought to be facilitated. Several machines of such a kind were contrived during the seventeenth and eighteenth centuries, but the only two of them which have been clearly described were that of Professor Gersten, of which he himself gave a description in an early volume of the *Philosophical Transactions*, and that of Pascal, which Diderot described in the *Encyclopédie Méthodique*.

It would be scarcely possible to give a detailed description of the mechanism by which the process of computation was performed in these machines: even engraved representations of the several parts, elucidative as they often are of written description, would in these instances be embarrassing to a general reader. We will therefore endeavour briefly to indicate the *kind* of movements which it is necessary to produce, instead of detailing the various positions of wheels, pinions, levers, screws, &c.

If we notice the manner in which quantities are, as it were, *built up* in the common system of numeration, we find each figure is worth ten times as much as it would be worth, if occupying a position one place to the right of it. Thus: 1728. Although 8 is greater than 2, yet the 2 in this position stands for a larger sum than the 8, because it occupies a position to the left of it. The quantities really expressed then by the figures

1728 are $\begin{cases} 1000 \\ 700 \\ 20 \\ 8 \end{cases}$, but in common practice we leave out

the cyphers, and place the significant figures side by side, taking care to keep them in the proper position from the right hand.

Now, if we have a wheel on whose axis is a pinion, with leaves or teeth,—if these teeth work into another set of teeth on the periphery of another wheel, and if the teeth on the latter are just ten times as numerous as those on the pinion, the pinioned wheel will revolve just ten times as fast as the other*. Here we have a certain sort of analogy between the decimal notation and the working of the wheels: it takes ten units to make up one figure or unit in the second place in common numeration, and it requires ten revolutions of the pinioned wheel to impart one revolution to the other wheel. Now this analogy applies to the machines to which we allude. There are generally several dial-faces, each marked with figures from 1 to 10. These dial-faces are fixed upon wheels, the teeth of which work into the pinions of other wheels, on which are similarly divided faces or disks. Then, while one face indicates units, another will indicate tens, another hundreds, and so on. The mode in which these wheels are made available in computations depends on the particular construction of the machine; but the principle to which we have just alluded is observable in all. In M. Gersten's instrument, for instance, if 32 were to be added to 59, two disks, or dial-faces, had to be turned by hand, until two index-points pointed to the two figures 5 and 9, one on each plate: then two slides were adjusted, until two indices pointed to the figures 3 and 2, one on each slide. Both the disks and both the slides were connected with toothed rack-work, which, interlocking one with another, turned another dial-plate in such a direction as to show 91 on its face, which is the sum of 32 and 59. If, on the contrary, it were required to subtract 59 from 91, indices would be pointed to 9 and 1, on two separate disks, and to 5 and 9, on two separate slides, and the movement, in an *opposite direction* to the former, of these disks and slides, would turn another wheel, so as

* See an article on the "Wheel and Axle," in Vol. XV., p. 131, of this work.

to show 32 on its face, the difference between 59 and 91. The process of multiplication was effected by a kind of reiteration of additions, and that of division by a succession of subtractions.

In the machine constructed by Pascal, the arrangement of the parts was to facilitate performance of certain numerical calculations connected with the duties of an office held in Upper Normandy by Pascal's father. These calculations had reference to pecuniary matters, which were reckoned in the currency of France, as existing at that time: the *denier* wheel had twelve teeth, representing the number of deniers in a *sol*. The *sol* wheel had twenty teeth, equal to the number of *sols* in a *livre*, above which each wheel had ten teeth, indicating 10, 100, 1000, &c. *livres*. Each wheel in the series carried a cylindrical barrel, on which were engraved the ten arithmetical characters. The wheel which expressed each order of figures or units was so connected with the wheel which expressed a superior order, that when the former passed from 9 to 0, the latter was advanced one figure.

Although this mechanism seems to have been adapted to one particular purpose, there is no evidence that it was ever brought into practical use. It was intended for the performance only of particular arithmetical operations, and it is doubtful whether even those could be performed by it so readily as by the pen of a ready computer. It is however important to remark that the principle of construction observable in those instruments was the forerunner of a modern instrument, which not only eclipsed all the calculating instruments or machines before constructed, but is deemed to be one of the most splendid pieces of mechanism that any age or country has produced: we allude to Mr. Babbage's calculating machine. We shall give a brief account of this machine in our next paper, but wish, in the mean time, to draw attention to the fact, that it is by the action of one toothed wheel upon another, making it revolve slower or faster, that the process of computation is conducted.

THE SPRING FAIR AT PEST, HUNGARY.

As I happened to be at Pest, during the great Spring Fair, I was not only provided with ample materials for amusement, but an opportunity of seeing the motley population of natives and strangers, which are usually attracted on this occasion; for though the Magyars, who have given their name to Hungary, are the greatest landed proprietors, and hold the reins of government, yet they are inferior in numerical force to the Slavonians, (or Totoks,) the original inhabitants. These are divided into at least half a dozen separate tribes, each speaking a different patois; and if to them we add the colonies of Germans, Wallachians, Greeks, Armenians, French, Italians, Jews, and Gipsies, speaking their own languages, and retaining their national manners, customs, and religions, we may term Hungary a miniature picture of Europe.

My first lounge was through the fair, which afforded as many groups for the painter as for the observer of life and manners; the Babel-like confusion of tongues was endless, and the costume and appearance of the motley tribes could not have been equalled in variety by any other fair in Europe, or even by the most entertaining maskers that ever trod the Piazza San Marco, or the Corso at Rome; because here each performed his natural character. The most prominent figures in the group were ever the proud Magyars, particularly those just arrived from the provinces. The dress of some of these noblemen was indeed singular, consisting of a tight sheep-skin coat, or mantle, the woolly side inwards; while the other was gaudily embroidered all over with the gayest flowers of the parterre, in coloured silk, among which the tulip was ever the most prominent. Those whose wealth permitted it, were to be seen habited in their half-military, half-civil costume; and you might in truth fancy from their haughty demeanour, that you were beholding a feudal lord of our own country of the middle ages, as, mounted on their fiery steeds and armed with sword and pistols, they galloped through the parting multitude, upon

whom, when the slightest interruption occurred, they glanced with scorn and contempt.

Among crowds of Jews, Turks, Greeks, Armenians, Tyrolians, Germans, Slavonians, Italians, and Hungarian peasants, were groups of Gipsies, their black matted locks shading their wild sun-burnt countenances, exhibiting their dancing-dogs, bears, and monkeys, or playing a lively tune for the amusement of the surrounding multitude, these itinerants being the popular musicians of Hungary. In another part of the fair, mountebanks on elevated platforms were relating the exploits of the famous robber, Schrubar, in the great forest of Bakony; or the ravages committed by the dreadful monster, half serpent, half flying dragon, that lately rose out of the Balaton lake, together with the most veritable history of the reappearance of the renowned Merman, who had inhabited, for the last two years, his own extensive domain, the Hansag marshes. All these astonishing marvels, besides hundreds of others, were listened to by the peasants, not only with attentive ears, but open mouths, and were illustrated by paintings as large as life, depicting the extraordinary wonders, executed in a style which set all imitation at defiance.

Bread, cakes, cheeses, vegetables, &c., were heaped on high in the streets, with the owners of each separate pile squatted in the midst. The savoury odour of frying sausages attracted some gourmands; whilst others feasted on the lighter refreshments of pastry, which the accomplished *cuisiniers* were preparing for their gratification.

But the popular viand was evidently the cray-fish, which all ranks, however otherwise engaged, were incessantly consuming; nor did they in this manifest any deficiency in *goût*, as the flavour of the little dainties was really excellent, and I have rarely seen them exceeded in size. Indeed, to thread the mazes of this great Hungarian fair, so as to obtain a view of its rarities, was an undertaking of no little difficulty, on account of the immense pyramids of wool, hides, tobacco, and other raw materials, which ever stood in the way; and as these articles were most tempting baits to the cupidity of the Jewish traders, they might constantly be seen making use of all their cajoling eloquence, while prevailing upon the artless peasant to dispose of his wares, at a price little more than nominal. When, however, the case was reversed, and the gaudy merchandise of the Jew and Armenian traders induced the peasant to become a purchaser, the balance of trade was considerably against him.

But, perhaps, of all the groups over which my eye wandered, none more strongly arrested my attention than the Saxon colonists: these were attired in the same costume in which their ancestors, some centuries gone by, had emigrated from their father-land, their blue eyes and heavy quiet countenances forming a striking contrast to the vivid glances of the half-Asiatic people around them. Nor were their moral traits less distinctly defined; for the prudent German, well knowing he was in the society of some of the most accomplished pickpockets on the Continent, wisely determined that they should not prey upon him, for he did not once remove his hand from his pocket, while his good woman never failed to keep watch behind, attended by her little ones, who, on the approach of the half-wild Gipsy, timidly covered their flaxen heads in the many folds of mama's cumbrous petticoat.

I would above all things recommend every traveller who may visit Pest during the Spring Fair not to leave it without taking a morning's ramble through the town. He will then see thousands of men, women, and children lying about the streets, beneath the piazzas, or in the numerous barks on the river, with no other covering save the canopy of heaven and their own sheep-skin mantles: he will also, still more to his surprise, behold them anointing their persons with lard, in order to protect themselves during the day from the effect of heat, and the bites of vermin and insects.—SPENCER'S *Travels in Circassia*, &c.

BENEVOLENCE, animated by Christian motives and directed to Christian ends, shall in no wise go unrewarded; here, by the testimony of an approving conscience; hereafter, by the benediction of our blessed Redeemer, and a brighter inheritance in His Father's house.—BISHOP MANT.

As it is in all cases necessary, on the one hand, to guard against the intrusion of empirics; so, on the other, it is expedient that we attach not ourselves, by undue prejudice, to any system of things, merely on account of a long acquaintance with it.—MAUND.

THE MAGPIE, (*Corvus pica*, LINN.)

THIS shy and distrustful, but very beautiful bird, is generally found at no great distance from human dwellings. To judge of the beauty of the magpie we must not be contented with a view of the bird in confinement, for under such circumstances it is seen to great disadvantage; the plumage is soon deprived of its brilliancy, and has a dull and dirty appearance; the bird loses much of its lively and restless character, and has not the same arch and animated expression of the eye, for which, in its natural state, it is so remarkable. At the same time it becomes familiar and attached to its owner when tamed, and its natural disposition to chatter, rather increases than diminishes; so that when taken young, it may be taught to pronounce words and even sentences, and will readily imitate any singular noise.

The body of the magpie is rather short and round, but with the addition of the tail measures about eighteen inches in length: the stretch of the wings is nearly two feet; the weight of the bird nine ounces. The wings are not calculated for long flights, but are better adapted for ascending and descending. They are broad and rounded, and the flight of the magpie appears to be accomplished with some difficulty. To a superficial observer, the colour of the plumage of this bird appears simply black and white. On a more careful inspection, however, it will be found that various beautiful hues and reflections, green, blue, purple, violet, &c., adorn the wing-feathers and tail, enlivening the sombre plumage, and giving it a rich and glossy appearance. The white on the breast, belly, and inside of the wing-feathers, is remarkably pure. Occasional varieties in colour have sometimes been observed, as in the case of the allied species; the more remarkable are pure white plumage, or white streaked with black, and also pale buff, or cream colour. The female magpie differs from the male in being smaller, and having a shorter tail.

The magpie is common in England, France, Germany, and most other countries of Europe. It has been seen in China, in Kamschatka, in Hudson's Bay, and on the banks of the Mississippi. The fact of its being thus widely dispersed, proclaims the hardy nature of the bird, and the capability which it has of accommodating itself to varieties of climate. In whatever part of the world it is found, the character of the bird is the same. Like the jackdaw, it is renowned for its prying, pilfering disposition, and is the subject of many an anecdote illustrative of thievish propensities. It is also regarded as a bird of good or evil omen, according to the situation or circumstances in which it is observed. The tree in which it nestles is seldom uprooted by the most violent gale of wind, and this circumstance, which arises from the careful choice made by the bird of a thick-branched and firmly-rooted tree, is looked upon as a sign of the mysterious influence of the magpie. The house on which a magpie perches is said to be safe from falling, and this superstition is evidently derived from the former one, though without the same common-sense reason being applicable to it. We have read of a man who was accustomed to go to a particular spring or well for water every day, and was always followed thither by a tame magpie; but it happened that one sultry day in summer, the fountain was almost dried up, and yielded a very scanty supply. The ignorant and superstitious water-carrier, having observed that on this occasion the magpie had hopped on before him instead of following in his usual manner, and that the bird had perched himself near the well, and was looking down into it, and then looking up at his master in a very sagacious manner, immediately conceived the idea that it was through the agency of the magpie, that the water had disappeared, and that the cunning bird was enjoying his trouble and annoyance. Possessed with this idea, he pelted poor Madge with stones, and though he contrived to elude his vengeance

at the time, yet he never forgave the bird for this supposed injury, or ceased to regard him with superstitious fear and dislike. It is common to hear the appearance of magpies spoken of as lucky or unlucky, according as their number is an even or an odd one. If they perch on a beast, it is a sign of evil to the animal, and for this, there is occasionally some reason. Like the raven and the crow, the magpie is very discerning, and quickly ascertains the symptoms of disease and death. Before the fact may have been observed by man, these birds are able to discover signs of decay, and watchfully notice the sickly among the flock. Lambs, and even sheep, are attacked by them, when in a weakly state; and they invariably commence the assault by aiming at the eyes of the animal. But their prey more frequently consists of smaller animals, such as young birds, field-mice, leverets, young poultry, fish, insects, &c. Fruit of all descriptions appears agreeable to them, and when nothing else is within reach, they content themselves with grain. They are loud and clamorous birds, and it is said that they frequently deprive the fowler of his sport, by giving the alarm to all the other birds with their noisy chatterings. Though not a bird adapted for high and powerful flights, the magpie is of so restless a character, that it seldom remains still for any length of time, but flies from tree to tree, or skips from one branch to another, shaking its long tail almost incessantly.

No birds display greater industry in the formation of their nests than magpies: they generally select a tree with thick branches, as being best calculated for the protection and concealment of their large nest; and they are often found to choose one which is in the immediate vicinity of a farm-house. The situation chosen by these birds, however, is not always of this description. The tall tangled hedge-row, the fir-grove, or the old well-wooded inclosure, are spoken of by Mr. Knapp in the *Journal of a Naturalist*, as being the places in which it delights to build: a lofty elm or thorn-bush or apple-tree, at some distance from dwellings, are mentioned in the *Ornithologia* as the places most likely to contain its solitary nest: other writers describe the magpie's nesting-place as being the tall hedge, or thick tree, near the cottage, and Rennie tells us from his own observations, that "in the north, almost every farm has its denizen pair of magpies, which incubate in their hereditary nest on the old ash tree, year after year, precisely like an hereditary colony of rooks." In the business of building their nest, the male and female both take their part. They begin this work together in February, placing the nest in such a position that it shall be completely enveloped and surrounded with branches, and, when the leaves appear, quite concealed from sight. In this respect they differ greatly from the rooks, who seem at no pains to hide their progeny, but place their nests in situations where they can be plainly observed from beneath, and where the bickerings constantly going on among the different members of the community in the vicinity of the nests, often afford amusement to those who watch their proceedings.

The magpie's nest is very large; for although the diameter of the inside of the nest does not exceed six inches, it is upwards of two feet on the outside. It is made of small branches, interlaced together, and having at the bottom a matting of soft flexible roots. The twigs are continued over the top of the nest as a sort of dome, but this dome seems rather a protection from enemies, than a defence against the weather. The only opening is at the side, and the distance from this opening to the central hollow of the nest where the eggs are deposited is considerable, so that the female in the process of incubation has room for her long tail. The order in which the construction of the nest is carried on, is said to be this: first the hawthorn branches which are to compose the body of the nest are arranged in their proper order; then a lining of fibrous roots and long

grass is laid in, and afterwards a smooth plastering of mud and clay. After the nest is so far completed, and made firm and commodious, the canopy which is to defend it above, is added. The sharpest thorns are chosen for this purpose and woven together in such a manner as to deny all entrance except at the door. So carefully and patiently do these birds provide all that is in their power for the safety and well-being of their young!

The Reverend John Hall gives a remarkable instance of a low situation chosen by magpies for the construction of their nest.

On the road between Huntly and Portsoy, he says, I observed two magpies hopping round a gooseberry bush, in a small garden, near a poor-looking house, in a peculiar manner, and flying out and into the bush. I stepped aside to see what they were doing, and found, from the poor man and his wife, that these magpies, several succeeding years, had built their nest and brought up their young in this bush, and that foxes, cats, hawks, &c., might not interrupt them, they had barricaded, not only their nest, but had encircled the bush with briars and thorns, in a formidable manner, nay, so completely, that it would have cost a fox, cunning as he is, some days' labour to get into the nest. The materials in the inside of the nest were soft and warm, but all on the outside so rough, so strong, and firmly entwined with the bush, that without a hedge-knife, hatch-bill, or something of the kind, even a man could not, without much pain and trouble, get at their young, for from the outside to the inside of the nest extended as long as my arm. The magpies had been faithful to one another for several summers, and drove off their young as well as every one else that attempted to take possession of the nest. This they carefully repaired and fortified in the spring, with strong rough prickly sticks, that they sometimes brought to it by uniting their force, one at each end, pulling it along when they were not able to lift it from the ground.

The industrious and sagacious habits of the magpie are well illustrated by the above anecdote, and we may here observe, that if the birds be disturbed during the building of a nest, or if the nest be destroyed immediately on its completion, they do not enter upon the construction of another, (which, indeed, would be a wearisome undertaking, if we are to believe the account which says, that they are occupied two months in forming their nest,) but easily content themselves with an old nest of their own species, or the vacated nest of a crow, which they repair, and render available for their purpose.

Magpies have in general only one brood in the year, but, if their young be destroyed, they sometimes have a second, or even a third brood. The number of eggs is usually six or seven, of a yellowish-white colour, spotted with brown and grey. The male and female sit alternately for about fourteen days, when the young ones are hatched, and become the objects of their parents' unceasing care and attention for a considerable time. When first hatched they are blind, and continue so for several days. In supplying the wants of their young, magpies are very much addicted to plundering the nests of other birds of their eggs.

Advantage is sometimes taken of this circumstance to worry the poor magpie, especially when her nest is near a dwelling, and has attracted the attention of school-boys. An egg is emptied of its contents by blowing, and bird-lime is introduced to fill the vacancy; the egg is then laid in some place where it is sure to attract the notice of the bird; and poor "Madge" soon approaches, cautiously hopping in various directions to see that all is safe. She then advances to the egg, and dashes her bill into it, in her usual manner, to convey it away to her brood; but as the shell is already broken, the bill penetrates very deep, and the shell is forced up towards the eyes, where adhering, by reason of the bird-lime, it forms a complete blind, and prevents the bird from seeing her way. She takes flight however, and knocks herself against the twigs and branches of trees, in a ridiculous manner, before she can disengage herself from the egg-shell. This foolish sport must be the occasion

of much pain and inconvenience to the poor bird, as well as to her young, who are deprived of her care while she is labouring with her annoyance.

The councils which magpies appear to hold together, at particular seasons, commonly called "folk-motes," are associated in the minds of many with superstitious and ominous notions. The innocent objects of terror, while meeting together most probably for the purpose of choosing mates, are supposed to be conspiring and clubbing their wits, for the weal or woe of the inhabitants of the neighbouring village. If they are of an even number and carry on their cheerful, noisy chatter, it is supposed to betoken good to old and young—but if there is an odd magpie perched apart from the rest, silent, and disconsolate, the reverse of this is apprehended, and mischievous consequences are inevitably expected. The sudden silence which sometimes pervades a folk-mote, or assemblage of magpies, is owing to their perception of the approach of a hawk or falcon. All their lively hoppings and chatterings are immediately at an end, and they remain motionless on the ground, as if all their faculties were absorbed in apprehension of their danger. When bushes are immediately at hand they creep into them for shelter from their enemy; and where large hawks are frequently seen, it has been observed that the magpies uniformly select some spot for their place or rendezvous, which is closely surrounded by broom, or furze, or low shrubs of some description, to which they may betake themselves.



THE MAGPIE.

CREDULITY is a far greater source of error than superstition, for the latter must be always more limited in its influence, and can exist only, to any considerable extent, in the most ignorant portions of society, whereas the former diffuses itself through the minds of all classes, by which rank and dignity are degraded, its valuable labours confounded with the vain pretensions of empiricism, and ignorance is enabled to claim for itself the prescriptive right of delivering oracles, amidst all the triumphs of truth and the progress of philosophy. Credulity has been justly defined, *belief without reason*, while scepticism, its opposite, is *reason without belief*, and the natural and invariable consequence of credulity; for it may be observed that men who believe without reason are succeeded by others whom no reasoning can convince.—PARIS.

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